



Drinking Water Quality Regulator
for Scotland

Incident Summary

Sandy Loch WTW
Disinfection failure
27 February 2019

DWQR Inspector:
Bill Byers

Event No. 10046

Event Category: Significant

On 27 February, treatment works Operators experienced control issues with the disinfection process. The automatic process was shifted to manual to attempt to recover control but this proved unsuccessful. The plant was then placed on a set flow rate to bring some stability to processes whilst a specialist Engineer was arranged to attend site. On 1 March, the Engineer altered dosing control settings and put in place an improvised control on the dosing pumps. Further changes were made to the system controls on 4 March, seemingly bringing an improvement. This was short lived as a filter washing routine caused changes to the flows through the plant and instability to return to the automatic disinfection process. The process was again reverted to manual control and a set flow imposed through the plant. The system was deemed to be stabilised by the evening of 7 March. Over the period 3 - 7 March, the variable chlorine dosing failed to ensure the treated water met Scottish Water's disinfection policy requirements for chlorine contact time, with the required Ct value being breached several times. Monitoring samples taken from final water over these days and in the following days, showed there to be no failures of microbiological standards.

Scottish Water has attributed the loss of process control and ultimate failure to disinfect the water to be due to deficiencies in the control system. Control was provided by a standalone Dulcometer controller operating on a flow proportional basis with an element of trim on post contact tank residual. At the time of the control difficulties, the normal OSEC generation unit was offline awaiting an upgrade and the sodium hypochlorite solution was being batched manually and this causes a variance in the strength of each batch. The control of chlorine dosing is clearly made more difficult at this site due to the dual use of the chlorine contact tank as a reservoir for the filter backwash water. As a wash is carried out, the draw down on the tank level causes changes to the volume of water within which the chlorine dose is applied and in the flow to the post contact tank instruments. The variance in different batch strength and flows through the works coupled with flow changes caused by filter backwashing, lead to progressively wider swings in the chlorine residual, loss of control and extended difficulty in properly recovering processes.

The event has been categorised as Significant. Scottish Water has identified two actions which DWQR accepts are appropriate and will monitor to ensure they are completed prior to signing off the incident. DWQR made two additional recommendations.

